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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/555,853

11/01/2005

Yasuo Ohama

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EXAMINER

SONG, MATTHEW J

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,853	Applicant(s) OHAMA, YASUO	
	Examiner Matthew J. Song	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/1/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kemmochi et al (US 6,641,663) in view of Sato et al (US 6,136,092) and Ohama (US 2002/0192409 A1).

Kemmochi et al teaches a quartz crucible comprising an outer layer formed by melting natural silica powder (purified natural quartz) (col 3, ln 20-45); a first transparent layer 18 made of natural quartz formed on the inside thereof (col 3, ln 40-65; col 5, ln 1-20 and claim 21); and a second transparent layer 16 made of synthetic quartz glass formed over the entire inside surface, this clearly suggests 1.0 L (Fig 1; Fig 3; col 3, ln 35-67; col 5, ln 1-20 and claim 31).

Kemmochi et al teaches an outer translucent silica glass layer (col 3, ln 20-30).

Kemmochi et al does not teach an opaque outer layer.

In a method of forming a quartz crucible, note entire reference, Sato et al teaches an opaque outer layer and a transparent inner layer (col 3, ln 30-40).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kemmochi et al by using an opaque outer layer, as taught by Sato et al, because an opaque outer layer has a higher strength than transparent quartz (col 1, ln 40-50).

The combination of Kemmochi et al and Sato et al does not explicitly teach the first transparent layer has a thickness of 0.4-5.0 mm. The combination of Kemmochi et al and Sato et al teaches a side portion has a thickness of 10.0 mm with an inner layer of 0.2-1.0 mm and a bulk layer of 6.5-9.4 mm, thus a first transparent layer having a thickness of 0.4-5.0 mm can be inferred based on a total thickness of 10.0 mm. Furthermore, Ohama et al teaches a quartz crucible comprising a translucent outer layer of quartz, a transparent inner layer and an intermediate layer ([0013]-[0016]). Ohama et al also teaches the thickness of the intermediate layer of 0.5 mm or more ([0023]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kemmochi et al and Sato et al by using an intermediate layer of 0.5 mm or more, as taught by Ohama et al, to provide a crucible with sufficient strength to the crucible ([0019]).

Referring to claim 2 and 22, the combination of Kemmochi et al, Sato et al and Ohama et al teaches a second transparent layer thickness of 0.2-1.0 mm ('663 col 3, ln 50-67).

Referring to claim 3, the combination of Kemmochi et al, Sato et al and Ohama et al teaches 1.0 L, as discussed previously.

Referring to claim 4, see the remarks for claims 2-3 above.

Referring to claims 5, 18-20 and 25, the combination of Kemmochi et al, Sato et al and Ohama et al teaches an opaque silica with an OH group concentration of 80 ppm or less ('092 col 3, ln 55-67) and an inner layer with an OH concentration of 100-400 ppm to a depth of 1 mm, with an inner layer thickness of 0.5 mm ('409 [0023]), which suggests an intermediate layer OH concentration of 100-400 ppm for the intermediate layer. Overlapping ranges are prima facie

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obvious (MPEP 2144.05). In regards to the relation limitation, the ranges overlap the claimed ranges thus the relationship would have been obvious to one of ordinary skill in the art.

Referring to claims 6 and 15, the combination of Kemmochi et al, Sato et al and Ohama et al teaches forming an opaque outer layer, a transparent transition layer (first transparent layer) and a transparent inner layer (second transparent layer), wherein the second transparent layer extends over the entire inner surface of the crucible (1.0L), as discussed previously. The combination of Kemmochi et al, Sato et al and Ohama et al also teaches flowing silica powder, melting and vitrifying to form the transparent layer ('409 [0037] and '663 col 4, ln 10 to col 5, ln 30).

Referring to claims 7-8 and 10-14, the combination of Kemmochi et al, Sato et al and Ohama et al does not teach the claimed number of brown rings in relation to the surface level of the melt. First, this limitation is merely an intended use because the limitation does not provide any structural limitation, only a measurement of brown rings after pulling a single crystal, which is a method limitation. The combination of Kemmochi et al, Sato et al and Ohama et al is capable of performing the claimed intended use, thus meets the claimed limitation. Second, the crucible taught by the combination of Kemmochi et al, Sato et al and Ohama et al is expected to have the claimed number of brown rings in the relation to the surface level of a silicon melt if performed in the claimed intended use because the combination of Kemmochi et al, Sato et al and Ohama et al teaches the same crucible as applicant in terms of crucible material and OH concentration. Therefore, a similar crucible is expected to have similar properties after performing a particular intended use. The same arguments apply to claim 11, which claims a similar intended use limitation of an etching treatment or sandblasting because an etching treatment or sandblasting is

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an intended use and the crucible is expected to have similar properties after performing the claimed intended use.

Referring to claim 9, the combination of Kemmochi et al, Sato et al and Ohama et al teaches a mixture of natural and synthetic quartz can be used to form the inner layer ('409 [0029]).

Referring to claim 16, the combination of Kemmochi et al, Sato et al and Ohama et al teaches 1.0L, as discussed previously.

Referring to claim 17, the combination of Kemmochi et al, Sato et al and Ohama et al teaches an inner layer of 0.2-1.0 mm ('663 col 3, ln 50-67). Overlapping ranges are held to be prima facie obvious (MPEP 2144.05).

Referring to claim 21, 23 and 24, the combination of Kemmochi et al, Sato et al and Ohama et al teaches an opaque outer layer, a first transparent layer having a thickness within the claimed range and a second transparent layer, as discussed previously. The combination of Kemmochi et al, Sato et al and Ohama et al also teaches the entire first transparent layer and the second transparent layer extend over the entire inner surface, thus would extend over the two distances of 0.15 and 0.55 times the total distance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song
Examiner
Art Unit 1792

MJS
October 28, 2007

***/Robert Kunemund/
Robert Kunemund
Primary Examiner
TC 1700***